

## ABSTRACT

Disclosed herein are an ultraviolet irradiation apparatus for photochemical reactions which can irradiate the photo-reactive solution with ultraviolet rays having a specific wavelength suitable for the intended photochemical reaction at a high efficiency, and a process by which a provitamin D derivative can be converted into a previtamin D derivative at a high efficiency by means of a photochemical reaction by one-step process of light irradiation, thereby preparing a vitamin D derivative at a high efficiency.

The ultraviolet irradiation apparatus irradiates the photo-reactive solution with the ultraviolet rays having the specific wavelength through a quartz rod. Specifically, the apparatus is constructed by an electric discharge lamp, a condensing and reflecting mirror and a plane mirror both having wavelength selective property, an optical filter which transmits the ultraviolet rays having the specific wavelength, and a quartz rod on which the ultraviolet rays having the specific wavelength are struck. The photo-reactive solution is irradiated with the ultraviolet rays from the quartz rod. The quartz rod is immersed in the photo-reactive solution, or a reaction vessel is irradiated with the ultraviolet rays from the quartz rod.

In the preparation process of the vitamin D derivative, an ultraviolet irradiation apparatus for

photochemical reactions having an ultraviolet radiation-emitting lamp, an optical system having wavelength selective property and a quartz rod on which the ultraviolet rays having the specific wavelength from the optical system are struck is used, and a solution of a provitamin D derivative is irradiated with the ultraviolet rays having the specific wavelength emitted from the quartz rod to cause a photochemical reaction of the provitamin D derivative solution, thereby forming a previtamin D derivative. The previtamin D derivative is further subjected to a thermal isomerization reaction to prepare the vitamin D derivative.